CONTRACT NAS5-32605
EOSDIS IV&V

INTEGRATED SUPPORT ENVIRONMENT (ISE) ELEMENT VERSION DESCRIPTION

(Deliverable 0413)

June 14, 1996

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1. INTRODUCTION

1.1 Identification of Document

This is the Element Version Description Document for the Integrated Support Environment (ISE). The ISE is being established under the IV&V Infrastructure and Tools task (Task 4B) and will provide the tools and infrastructure necessary for the performance of the Earth Observing System Data and Information System (EOSDIS) Independent Verification and Validation (IV&V) contract.

1.2 Purpose and Scope of Document

The ISE is primarily comprised of Commercial Off-The-Shelf (COTS) products. However, the establishment of the ISE also includes developed tools. This document identifies version description information associated with tools which have been deployed at multiple geographically dispersed EOSDIS IV&V sites. The version description information captured within this document provides the information necessary to load the software source code, setup deployment files, and install developed tools. This document is intended to serve as an aid to system administrative personnel.

Note that no version description information is included within this document for the World Wide Web (WWW) based homepage applications. Hyper Text Markup Language (HTML) source is accessible through the EOSDIS IV&V, EOSDIS Ground System (EGS) Integration and Test, and the IADB homepages. Several Hyper Text Transfer Protocol (HTTP) servers are compatible with the HTML used for these pages.

1.3 Document Status and Schedule

This is the initial release of the ISE Element Version Description Document. This release of the version document includes information for the following ISE development items:

1. Automated Requirements Database (ARDB)
2. Project Issue Tracking System (PITS)
3. Test Management Database (TMDB)

Document updates are left to the discretion of the EOSDIS IV&V COTR and will be released as specified in the Infrastructure and Tool Development (Task 4) Statement of Work (SOW).

1.4 Documentation Overview and Organization

This document presents version description information which is being maintained for ISE development items. At a minimum, the version description information maintained includes

- the identification of source code, report, and graphics files,
- the currently deployed executable file versions, and
- Commercial Off-The-Shelf (COTS) software required to run the tools.

In addition to the version description information, this document contains an overview of the design approach, some general information on the types of applications being developed, and a brief description of the development tools and environment.

Since this document only addresses those elements of the ISE which are associated with new development, a complete understanding of the ISE can not be garnered from the review of this document. Refer to the ISE System Architecture Document to obtain a more complete understanding of the functionality to be exhibited by the ISE infrastructure.

Section 1 establishes the context of the document through an ***introduction***. This identifies the document, the scope and purpose of the document, and the status of the document.

Section 2 lists the ***related documentation*** including parent documents and applicable documents.

Section 3 describes the ***design approach and tradeoffs***. This section provides an overview of development initiatives, development tools, and the rapid prototyping approach that is being followed.

Section 4 details the ***version description information*** associated with ISE development items.

Section 5 contains a list of ***abbreviations and acronyms*** used in this document.

Section 6 contains a ***glossary*** of terms used in this document.

Section 7 contains ***notes*** pertaining to material in this document.

Section 8 identifies the ***appendices*** included in this document.

2. RELATED DOCUMENTATION

2.1 Parent Documents

The following documents are parents to this document:

1. "Statement of Work for the Independent Verification and Validation (IV&V) of the EOS Data and Information System and Key EOS Ground System Interfaces", dated April 19, 1993.
2. "EOSDIS IV&V Task 4 IV&V Infrastructure and Tool Development Task Statement of Work", dated 19 October 1994.
3. "EOSDIS IV&V Task 4B IV&V Infrastructure and Tool Development Task Statement of Work", dated 19 June 1995.

2.2 Applicable Documents

The following documents are referenced herein and are directly applicable to this volume:

1. ISE System Requirements Document (Deliverable 0404) dated 28 October 1994.
2. ISE System Architecture Document (Deliverable 0405) dated 30 January 1995.
3. ISE Element Requirements Document (Deliverable 0408) dated 14 April 1995.
4. ISE Element Software Design (Deliverable 0409) dated 14 July 1995.
5. ISE Element Users Guide (Deliverable 0411) dated 31 May 1996.

3. DESIGN APPROACH AND TRADEOFFS

3.1 Rapid Prototyping Approach

In the Rapid Application Prototyping and Incremental Development (RAPID) approach, the most important and critical software requirements are defined to the extent that current knowledge and experience permits for the incremental capabilities required. After a core set of requirements are documented for an incremental capability, a "quick" object oriented design addressing the current set of requirements is prepared, and a rapid prototype is developed and tested. The purpose of the prototype is to gain information about the requirements and confidence in the correctness of the prototype design. Design characteristics such as efficiency, maintainability, capacity, and adaptability are also considered in the prototype since the intent is to extend the prototype to fulfill capabilities required by the system. The developed prototype is evaluated by the end user to accumulate comments that result in the refinement of the documented requirements, design, and the prototype itself. This rapid prototyping approach is iterative and is repeated for each incremental tool capability.

3.2 ISE Development Infrastructure

The ISE system architecture reflects a networked heterogeneous environment incorporating several COTS products and a few developed or customized applications. The planned ISE architecture has been detailed in the ISE System Architecture Document dated 30 January 1995. The documented architecture depicts an environment which is flexible and supportive for incrementally adding tools as new needs and requirements are levied against the ISE. Exhibit 3.1-1 reflects the network/computational infrastructure of the ISE. Note that the infrastructure depicted also serves as the computational infrastructure necessary to support ISE development.

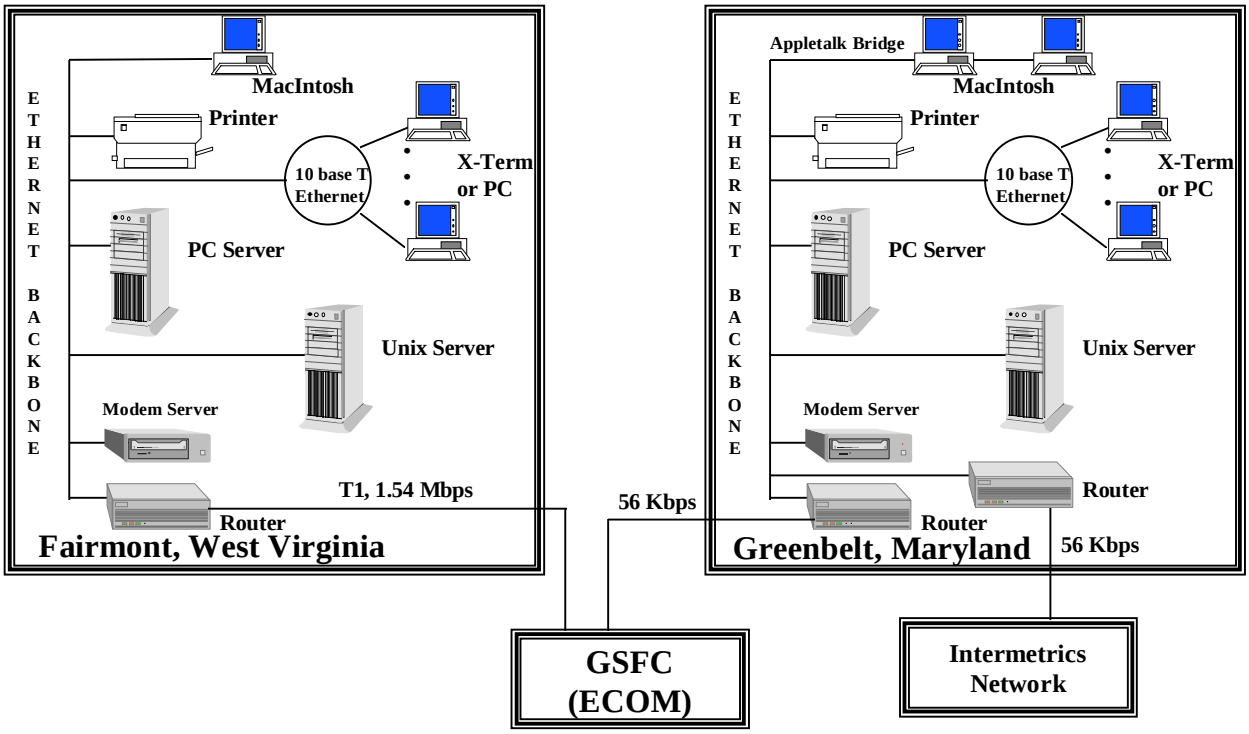

Exhibit 3.1-1 Network/Computational Infrastructure

In addition to the network/computational infrastructure, a high level understanding of the development infrastructure can be garnered from Exhibit 3.1-2, ISE Development Infrastructure. This exhibit depicts many of the COTS tools which are a part of the ISE as well as the tools necessary to satisfy tool development undertakings.

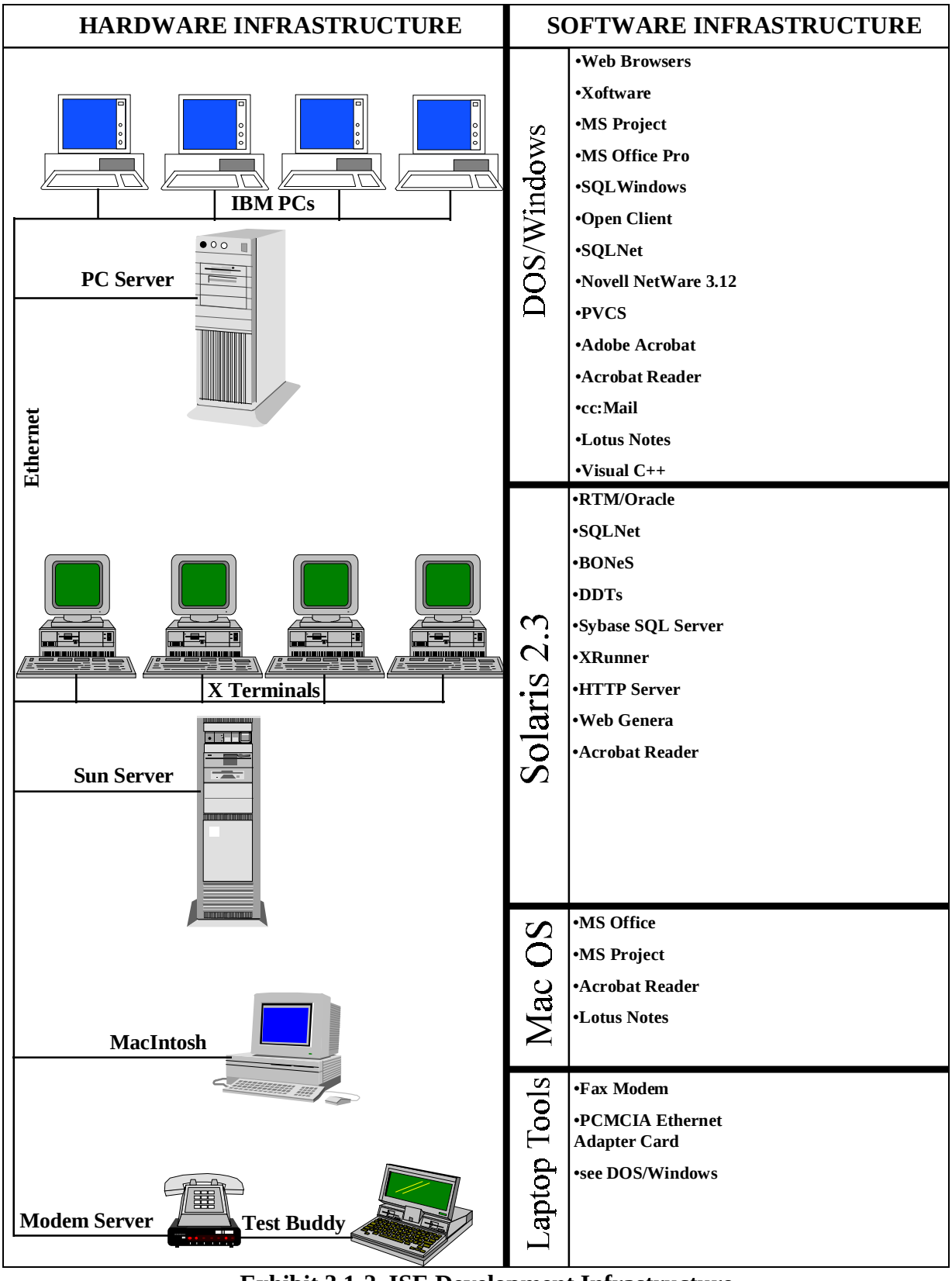

Exhibit 3.1-2 ISE Development Infrastructure

For additional information concerning the ISE network/computational infrastructure and ISE Toolbox tools, refer to sections 5.2.1 and 5.2.2 of the ISE System Architecture Document dated 30 January 1995.

3.3 Tool Development Overview

Based upon identified EOSDIS IV&V tool needs, development activities were initiated where no COTS solution existed that satisfied levied requirements. These development initiatives are limited to database and homepage applications. These types of applications yield benefits that automate labor intensive processing, provide support for working at geographically dispersed sites, and promote sharing of information. As a result of these benefits, IV&V activities yield higher quality products in a more timely and efficient manner.

3.3.1 Client/Server Development

The development of three client/server applications are targeted to support existing EOSDIS IV&V activities. These applications include:

- the Automated Requirements Database (ARDB),
- the Project Issue Tracking System (PITS), and
- the Test Management Database (TMDB).

Refer to section 4 of this document for detailed descriptions of these applications and the associated version description information. These applications are being developed using the Centura (Gupta prior to 1 January 1996) SQLWindows client/server development tool. SQLWindows is a Rapid Application Development (RAD) tool which allows for rapid prototyping of the graphical user interface (GUI) using a GUI builder. Once the interface is constructed, functionality is provided to associate database data from any number of COTS database management systems with the painted interfaces. Application code is then generated by SQLWindows to build the client/server application which can be deployed at various remote sites on as many PCs as desired without run-time fees. The server databases, which include RTM/Oracle and Sybase SQL Server, will reside at the location where the majority of access is expected so that client/server application performance is maximized. During development, the prototype applications will communicate with databases located at the NASA/WVU Software IV&V Facility located in Fairmont, WV.

4. Version Description Information

4.1 COTS Products

The ISE includes several COTS products. The COTS products delineated in the following subsections are required for some of the ISE developed tools. Sections detailing ISE developed tools will identify the specific COTS requirements for each tool.

4.1.1 Sybase SQL Server

Sybase SQL Server version 10.0.2 is currently being executed as a part of the ISE infrastructure. An upgrade to Sybase System 11.x will be performed during the summer of 1996. Refer to Sybase documentation for installation information.

4.1.2 Open Client

Open Client is a connectivity product offered by Sybase to communicate with a Sybase RDBMS. Open Client version 4.2.5 is a part of the ISE computing infrastructure. This tool permits PC client applications to communicate with a Sybase RDBMS either locally or over the Wide Area Network (WAN).). Installation instructions specific to the ISE environment are included in Appendix A.

4.1.3 RTM/Oracle

The Requirements Traceability Management (RTM) tool is marketed by Marconi Systems Technology. RTM version 2.3 is the operational version currently incorporated as an element of the ISE infrastructure. RTM utilizes an Oracle RDBMS to store information. Oracle version 7.1.4.1 is the ISE operational version. Marconi Systems Technology may be contacted at (703) 736-3500. Refer to RTM documentation for installation information.

4.1.4 SQLNet

SQLNet is a connectivity product offered by Oracle to communicate with an Oracle RDBMS. SQLNet version 7.1 is a part of the ISE computing infrastructure. This tool permits PC client applications to communicate with an Oracle RDBMS either locally or over the Wide Area Network (WAN). Installation instructions specific to the ISE environment are included in Appendix B.

4.1.5 SQLWindows

SQLWindows is a Rapid Application Development (RAD) tool by Centura (Gupta prior to 1 January 1996). Tools developed for incorporation into the ISE were built using SQLWindows version 5.0.2. SQLWindows includes a set of deployment files that must accompany executables created using the tool. SQLWindows deployment files are identified in Appendix C.

4.2 Automated Requirement Database (ARDB)

The Automated Requirements database is designed to support the monitoring and requirements management during the development of the EOSDIS Core System (ECS). The purpose of this tool is to facilitate a systematic requirements analysis of the requirement documents produced by the various organizations and supporting contractors. It also defines the links between the requirements and specific integration, verification, and validation tests which will be performed. The ARDB collects the results of requirements evaluation in terms of a numerical rating and the engineering rationale that substantiates the rating. The ARDB assists analysts in browsing requirements, reviewing evaluation criteria, assessing the traceability analysis, recording evaluations, identifying requirements with high ratings, and generating reports on the analysis.

4.2.1 ARDB COTS Requirements

The ARDB application requires remote access to both an Oracle database maintained by the RTM tool and a Sybase database where the requirements analysis data is stored. In order to connect to these remote databases network connectivity software is used. Open Client is used to connect to Sybase. SQLNet is used to connect to Oracle. These products must be installed on the client machine before the ARDB executable software is loaded.

See Appendix A for detailed instructions on Open Client installation.
See Appendix B for detailed instructions on SQLNet installation.

Once the connectivity software is installed and tested a C:\ISE_TOOL subdirectory should be created on the client machine. This subdirectory should contain a copy of the program executable, the necessary report and graphics files, and the deployment files supplied for SQLWindows applications. ARDB specific items are installed as a part of the ARDB executable installation (see section 4.2.3). SQLWindows deployment file installation instructions are detailed in Appendix C.

4.2.2 ARDB Source Code Installation

The ARDB source code (ardb7_0f.app) included on the ARDB source code installation diskette requires SQLWindows Version 5.0 or greater to read and compile. The report files (.qrp) require ReportWindows to read. The picture files are stored in a bitmap (.bmp) format. SQLWindows and ReportWindows are part of the Centura SQLWindows Development kit (see section 4.1.5). Files listed in the table below have been compressed using PKZIP.

FILE	SIZE	DATE	TIME
1. ARDB7_0F.APP	981,395	06-07-96	11:55a
2. EOS.BMP	26,518	02-16-95	10:28a
3. ISSUE.QRP	15,787	01-30-96	10:49a
4. LNGTRAC.QRP	8,741	01-19-96	2:18p
5. METRICS.QRP	11,241	04-04-96	5:05p
6. METRICS2.QRP	12,321	04-04-96	5:04p
7. MSCORE2.QRP	6,859	10-13-95	10:27a
8. ORPHAN.QRP	3,595	11-09-95	1:49p
9. SUM2.QRP	6,679	12-01-95	5:06p
10. SUM3.QRP	6,675	02-12-96	1:47p
11. SUMGRAPH.QRP	7,864	02-28-96	1:59p
12. SUMMARY.QRP	5,965	04-25-96	10:58a
13. TRACE.QRP	5,778	12-01-95	5:04p

Exhibit 4.2-1 ARDB Source Files

There are a total of 13 file(s) requiring approximately 1.1 megabytes of disk space.

4.2.3 ARDB Executable Installation

Version 3.1 ARDB installation is performed by running the "install.bat" file on the corresponding ARDB installation disk. The following table reflects the files installed by the installation batch file.

FILE	SIZE	DATE	TIME
1. ARDB.EXE	407,894	06-07-96	11:55a
2. EOS.BMP	26,518	02-16-95	10:28a
3. ISSUE.QRP	15,787	01-30-96	10:49a
4. LNGTRAC.QRP	8,741	01-19-96	2:18p
5. METRICS.QRP	11,241	04-04-96	5:05p
6. METRICS2.QRP	12,321	04-04-96	5:04p
7. MSCORE2.QRP	6,859	10-13-95	10:27a
8. ORPHAN.QRP	3,595	11-09-95	1:49p
9. SUM2.QRP	6,679	12-01-95	5:06p
10. SUM3.QRP	6,675	02-12-96	1:47p
11. SUMGRAPH.QRP	7,864	02-28-96	1:59p
12. SUMMARY.QRP	5,965	04-25-96	10:58a
13. TRACE.QRP	5,778	12-01-95	5:04p

Exhibit 4.2-2 ARDB Deployment Files

There are a total of 13 file(s) requiring approximately 526,000 bytes of disk space.

4.3 Project Issue Tracking System (PITS)

The PITS is an issue management environment consisting of an issue repository, or set of interoperable issue repositories. This document focuses on the "EOSDIS-IVV" repository that exists. IV&V analysts enter and update issue information via client-server interface screens. The client runs in a local PC Windows environment that connects to the Sybase Relational Data Base Management System (RDBMS) Sun SPARCserver at the NASA Software IV&V Facility in Fairmont, WV. The server location is transparent to users, other than possibly a small deviation in access times over the Wide Area Network (WAN). Non-IV&V users will have view (i.e., selective, read-only) access to the "EOSDIS-IVV" PITS repository from NASA-approved client application or PITS World Wide Web (WWW) browser sites (e.g., GSFC, HITS, etc.).

The PITS is configurable to a project. The values associated with issue characterization are specified in repository data base tables. The PITS issue characterization entities are:

- *Issue & Impact Categories:* Keyed to the system development lifecycle (values: "Requirements", "Integration & Test", etc.) and project management (values: "Engineering Processes", "Programmatics", "Basis Of Estimates", etc.);
- *Issue Domains*: Keyed to the intrinsic project development activities and phases (values: "ECS Rel A", "EGS Version 2", "EBnet", etc.);

- *Issue Milestone:* Keyed to formal reviews (values: “PDR”, “CDR”, etc.), used only if applicable to an issue-set;
- *Issue Severity:* (3 values: “Major”, “Moderate”, “Minor”);
- *Issue Criticality:* (3 values: “Critical”, “Essential”, “Fulfillment”);
- *Issue Visibility*: (2 values: “Public”, “Private”);
- *Issue Originator:* Author of the issue; and
- *Issue Sponsor:* (values: “Task01”, “Task02”, “Task04”, “Task05”, etc.).

Also, *Issue Status* (4 values: “Draft”, “Opened”, “Closed”, “Closed With Concerns”) and important *Issue Dates* (4 values: “Draft”, “Opened”, “Closed/Closed With Concerns”, “Updated”) are maintained within the PITS.

The vehicle for documenting and tracking issues within a PITS repository is the Technical Issue Memorandum (TIM). A TIM is a named, discrete collection of metadata (searchable issue characterization and status information), descriptive text, prescriptive text, and resolution progress information. Each TIM is focused on a clearly defined set of issues at the same level of importance. Each TIM supports the tracking of issue resolution progress to closure (via the PITS “Resolution Chronology”).

TIMs can be generated “stand-alone”, as issues are identified. However, TIMs, TARs, TAMs, RIDs, etc. can exhibit close relationships. A TAM, for example, may raise issues which necessitate formal tracking (i.e., they are of more than marginal-value). A TIM, or set of TIMs, would be generated based on the TAM. The PITS enables the resulting TIM(s) to be “linked” to the TAM to minimize data entry redundancy (i.e., to fully describe the subject issues by reference to the TAM). Multiple relationships are possible: TIM-TIM, TIM-TAM, TIM-TIM-TAM, TIM-RID, etc. (via the PITS “Relationships”). At the current time, these relationships are structured “textual” references. In the future, the relationships will be electronic, such that “clicking” on the related document will display a copy of that document (analogous to a hypertext link). Linkage across multiple repositories within a single PITS environment is also planned.

An on-line query capability is provided to permit metadata, keyword, and key phrase (text pattern) searches for TIMs that match viewer-desired characteristics. On-screen and hard copy reporting is available, and will continue to be enhanced over time. To support trend analysis, a monthly “snapshot” of the PITS’ repository metadata (TIM-by-TIM) will be permanently archived at the server site. This will enable the generation of standard and ad hoc statistical trend-analysis reports, over time.

4.3.1 PITS COTS Requirements

The PITS application requires remote access to the Sybase database on the FAIRMONT server where the issue repositories reside. In order to connect to this remote database, Open Client network connectivity software from Sybase is used. This product must be installed on the client machine before the PITS executable software can be executed.

See Appendix A for detailed instructions on Open Client installation.

Once the connectivity software is installed and tested a C:\ISE_TOOL subdirectory should be created on the client machine. This subdirectory should contain a copy of the program executable, the necessary report and graphics files, and the deployment files supplied for SQLWindows applications. PITS specific items are installed as a part of the PITS executable installation (see section 4.3.3). SQLWindows deployment file installation instructions are detailed in Appendix C.

4.3.2 PITS Source Code Installation

The PITS source code (pits2_6b.app) included on the PITS source code installation diskette requires SQLWindows Version 5.0 or greater to read and compile. The report files (.qrp) require ReportWindows to read. The picture files are stored in a bitmap (.bmp) format. SQLWindows and ReportWindows are part of the Centura SQLWindows Development kit (see section 4.1.5). Files listed in the table below have been compressed using PKZIP.

FILENAME	SIZE	DATE	TIME
1. PITS2_6B.app	1,441,002	06-07-96	9:21a
2. COMPRTM.qrp	6,693	05-20-96	4:14p
3. EDITVIEW.qrp	5,111	03-26-96	2:51p
4. ICWG.qrp	8,114	05-15-96	11:18a
5. ICWG2.qrp	5,965	04-25-96	10:58a
6. ICWGNUM.qrp	8,706	05-16-96	3:51p
7. IS_DATE2.qrp	18,611	03-26-96	3:27p
8. ISSUE.qrp	15,787	01-30-96	10:49a
9. METRICS.qrp	11,241	04-04-96	5:05p
10. METRICS2.qrp	12,321	04-04-96	5:04p
11. MSCORE2.qrp	6,859	10-13-95	10:27a
12. CLOSE.bmp	406	09-13-95	1:13p
13. QUERYRES.qrp	5,095	03-26-96	2:52p
14. RELAT.qrp	12,389	01-26-96	11:21a
15. RES_CRON.qrp	12,640	01-26-96	11:29a
16. RID.qrp	10,808	05-01-96	1:29p
17. SUM2.qrp	6,679	12-01-95	5:06p
18. SUM3.qrp	6,675	02-12-96	1:47p
19. SUMMARY.qrp	5,965	04-25-96	10:58a
20. DISCARD.bmp	346	09-13-95	1:13p
21. EOS.bmp	26,518	02-16-95	10:28a
22. FORWARD.bmp	578	09-13-95	1:13p
23. NEW-1.bmp	2,254	02-14-96	11:56a
24. NEWMAIL.bmp	534	09-13-95	1:13p
25. PITS_CRE.bmp	60,918	01-22-96	9:59a
26. REPLICA.bmp	406	09-13-95	1:13p
27. REPLY.bmp	578	09-13-95	1:13p

28. RESPONSE.bmp	630	09-13-95	1:13p
29. RETRIEVE.bmp	358	09-13-95	1:13p
30. SEND.bmp	534	09-13-95	1:13p
31. SHOWDOC.bmp	630	09-13-95	1:13p

Exhibit 4.3-1 PITS Source Files

Total of 31 file(s) requiring approximately 1.62 megabytes of disk space.

4.3.3 PITS Executable Code Installation

Version 2.6 PITS installation is performed by running the "install.bat" file on the corresponding PITS installation disk. The following table reflects the files installed by the installation batch file.

FILENAME	SIZE	DATE	TIME
1. PITS.exe	556,846	06-07-96	9:22a
2. COMPRTM.qrp	6,693	05-20-96	4:14p
3. EDITVIEW.qrp	5,111	03-26-96	2:51p
4. ICWG.qrp	8,114	05-15-96	11:18a
5. ICWG2.qrp	5,965	04-25-96	10:58a
6. ICWGNUM.qrp	8,706	05-16-96	3:51p
7. IS_DATE2.qrp	18,611	03-26-96	3:27p
8. ISSUE.qrp	15,787	01-30-96	10:49a
9. METRICS.qrp	11,241	04-04-96	5:05p
10. METRICS2.qrp	12,321	04-04-96	5:04p
11. MSCORE2.qrp	6,859	10-13-95	10:27a
12. CLOSE.bmp	406	09-13-95	1:13p
13. QUERYRES.qrp	5,095	03-26-96	2:52p
14. RELAT.qrp	12,389	01-26-96	11:21a
15. RES_CRON.qrp	12,640	01-26-96	11:29a
16. RID.qrp	10,808	05-01-96	1:29p
17. SUM2.qrp	6,679	12-01-95	5:06p
18. SUM3.qrp	6,675	02-12-96	1:47p
19. SUMMARY.qrp	5,965	04-25-96	10:58a
20. DISCARD.bmp	346	09-13-95	1:13p
21. EOS.bmp	26,518	02-16-95	10:28a
22. FORWARD.bmp	578	09-13-95	1:13p
23. NEW-1.bmp	2,254	02-14-96	11:56a
24. NEWMAIL.bmp	534	09-13-95	1:13p
25. PITS_CRE.bmp	60,918	01-22-96	9:59a
26. REPLICA.bmp	406	09-13-95	1:13p
27. REPLY.bmp	578	09-13-95	1:13p
28. RESPONSE.bmp	630	09-13-95	1:13p
29. RETRIEVE.bmp	358	09-13-95	1:13p

30. SEND.bmp	534	09-13-95	1:13p
31. SHOWDOC.bmp	630	09-13-95	1:13p

Exhibit 4.3-2 PITS Deployment Files

Total of 31 file(s) requiring approximately 1.4 megabytes of disk space.

4.4 Test Management Database (TMDB)

The Test Management database (TMDB) application is a tool that aids the analysts in the testing of requirements. Capabilities exist to selectively browse requirements with criteria such as: description keywords, release categories, requirement prefixes, requirement class IDs, segments, requirement status, types, source interfaces, and destination interfaces. Additional tasks allow the analyst to collect specific requirements under the guise of a Functional test thread. A test thread is defined to evaluate a specific service/task or a set of closely coupled services/tasks. A test thread confirms the ability to satisfy the requirements of a specific function in an isolated environment. Close examination of the specific or related services/tasks result in a grouping of requirements which point to a test thread. The test thread is broken down to several test cases to test the requirements, i.e. identify whether this service/task is able to satisfy all it's requirements. Test procedures, still retaining requirement traceability to the thread level, are developed for each test case. Finally, capabilities exist to prepare for test session planning, collect test session results, daily and flash test session reports, and support the preparation of the functional thread formal test report.

This application retains requirement traceability from the thread level through the test procedure level and permits the analyst to collect the test development and reporting information in a single repository. The application was developed to be portable and client/server based. Network connectivity over the Internet enables direct access to files from a testing site. Also for more remote areas there exists a high speed modem for access to the server in the absence of any internet connectivity.

4.4.1 TMDB COTS Requirements

The TMDB application requires remote access to the Sybase database on the FAIRMONT server where the requirements data is stored. In order to connect to these remote databases network connectivity software is used. Open Client is used to connect to Sybase. This product must be installed on the client machine before the TMDB executable software can be executed.

See Appendix A for detailed instructions on Open Client installation.

Once the connectivity software is installed and tested a C:\ISE_TOOL subdirectory should be created on the client machine. This subdirectory should contain a copy of the program executable, the necessary report and graphics files, and the deployment files supplied for SQLWindows applications. TMDB specific items are installed as a part of the TMDB executable installation

(see section 4.4.3). SQLWindows deployment file installation instructions are detailed in Appendix C.

4.4.2 TMDB Source Code Installation

The TMDB source code (tmdb3_1.app) included on the TMDB source code installation diskette requires SQLWindows Version 5.0 or greater to read and compile. The report files (.qrp) require ReportWindows to read. The picture files are stored in a bitmap (.bmp) format. SQLWindows and ReportWindows are part of the Centura SQLWindows Development kit (see section 4.1.5). Files listed in the table below have been compressed using PKZIP.

FILENAME	SIZE	DATE	TIME
1. TMDB3_1.APP	1,658,144	06-07-96	4:19p
2. EOSDIS2.BMP	11,336	09-08-95	12:16p
3. CCRIMTP.QRP	9,422	03-25-96	10:21a
4. DTP_TCS.QRP	10,095	03-27-96	5:11p
5. FTGT.QRP	9,454	01-04-96	2:03p
6. TESTREP.QRP	4,494	04-04-96	4:22p
7. TESTREP1.QRP	3,958	04-04-96	4:21p
8. THRD-TCS.QRP	15,080	01-04-96	4:22p
9. V0TEST.QRP	18,988	07-22-95	4:07p

Exhibit 4.4-1 TMDB Source Files

Total of 9 file(s) requiring approximately 1.8 megabytes of disk space.

4.4.3 TMDB Executable Code Installation

Version 3.1 TMDB installation is performed by running the “install.bat” file on the corresponding TMDB installation disk. The following table reflects the files installed by the installation batch file.

FILENAME	SIZE	DATE	TIME
1. TMDB.exe	650,919	06-07-96	4:19p
2. EOSDIS2.BMP	11,336	09-08-95	12:16p
3. CCRIMTP.QRP	9,422	03-25-96	10:21a
4. DTP_TCS.QRP	10,095	03-27-96	5:11p
5. FTGT.QRP	9,454	01-04-96	2:03p
6. TESTREP.QRP	4,494	04-04-96	4:22p
7. TESTREP1.QRP	3,958	04-04-96	4:21p
8. THRD-TCS.QRP	15,080	01-04-96	4:22p
9. V0TEST.QRP	18,988	07-22-95	4:07p

Exhibit 4.4-2 TMDB Deployment Files

Total of 9 file(s) requiring approximately 720,000 bytes of disk space.

5. ABBREVIATIONS AND ACRONYMS

Below is a list of the abbreviations and acronyms used in this document.

ARDB	-	Automated Requirements Database
BONeS	-	Block Oriented Network Simulator
CDR	-	Critical Design Review
CGI	-	Common Gateway Interface
COTR	-	Contracting Officer Technical Representative
COTS	-	Commercial Off-The-Shelf
CSMS	-	Communications and System Management Segment
DAAC	-	Distributed Active Archive Center
DBI	-	Data Browser Interface
DDTS	-	Distributed Defect Tracking System
DID	-	Data Item Description
DMDB	-	Data Management Database
EBnet	-	EOS Backbone Network
ECS	-	EOSDIS Core System
EDHS	-	ECS Data Handling System
EDOS	-	EOS Data and Operations System
EGS	-	EOS Ground System
EOS	-	Earth Observing System
EOSDIS	-	Earth Observing System Data Information System
ESDIS	-	Earth Science Data and Information System
ETS	-	EOSDIS Test System
FDF	-	Flight Dynamics Facility
FOS	-	Flight Operations Segment
FTP	-	File Transfer Protocol
GOTS	-	Government Off The Shelf
GS	-	Ground System
GSFC	-	Goddard Space Flight Center
GUI	-	Graphic User Interface
HAIS	-	Hughes Automated Information Systems
HITS	-	Hughes Information Technology Systems
HTML	-	Hyper Text Markup Language
HTTP	-	Hyper Text Transport Protocol
I&T	-	Integration and Testing
IADB	-	Interface Analysis Database
ICWG	-	Interface Control Working Group
ICD	-	Interface Control Document
IIR	-	Integrated Information Repository
IR1	-	Interim Release 1
IRD	-	Interface Requirement Document
ISE	-	Integrated Support Environment
IV&V	-	Independent Verification and Validation

LAN	-	Local Area Network
M&O	-	Maintenance and Operations
N/A	-	Not Applicable
NASA	-	National Aeronautics And Space Administration
NOAA	-	National Oceanic and Atmospheric Administration
OMT	-	Object Modeling Technique
PAR	-	Performance Assurance Requirements
PDF	-	Portable Document Format
PDR	-	Program Design Review
PITS	-	Project Issue Tracking System
PS	-	Postscript
RAD	-	Rapid Application Development
RAPID	-	Rapid Application Prototyping and Incremental Development
RBR	-	Requirements By Release
RDBMS	-	Relational Data Base Management System
RID	-	Review Item Discrepancy
RTF	-	Rich Text Format
RTM	-	Requirements Traceability Management
SCDO	-	Science and Communications Development Office (ECS)
SCF	-	Science Computing Facility
SDPS	-	Science Data Processing Segment
SMO	-	System Management Office
SOW	-	Statement Of Work
STD	-	Standard
StP	-	Software through Pictures
TAM	-	Technical Analysis Memorandum
TAR	-	Technical Analysis Report
TBD	-	To be determined
TBS	-	To be supplied
TIM	-	Technical Issue Memorandum
TMDB	-	Test Management Database
TRMM	-	Tropical Rainfall Measurement Mission
TXT	-	ASCII Text
V&V	-	Verification and Validation
WAN	-	Wide Area Network
WVU	-	West Virginia University
WWW	-	World Wide Web

6. GLOSSARY

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7. NOTES

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8. APPENDICES

8.1 Appendix A - Open Client Installation Instructions

The following Open Client installation instructions are specific to the ISE infrastructure and will enable access to Sybase SQL Server.

1) Insert Disk 1 - netlib
2) Click on setup_10.exe (in file manager)
3) Click on OK (license agreement)
4) Click on OK (c:\sql10 is default)
5) Click on LAN Workplace TCP/IP then OK
6) host: fairmont.ivv.nasa.gov, port: 10412, then click on OK
7) Click on OK (SYBASE is default)
8) Click on Install (review information first)
9) Yes (modify autoexec.bat)
10) Click on OK (license agreement)
11) Click on OK (reboot)
12) Insert Disk 2 - cdevkit1 (C developers kit)
13) Click on setup_10.exe (in file manager)
14) Click on OK (license agreement)
15) Click on OK (c:\sql10 is default)
16) Yes (sql10 exists)
17) enter username of person using the PC on which install is being performed.
18) Yes (debuggable version)
19) Yes (on-line help)
20) Click on Install
21) Insert Disk 3 - cdevkit2 (C developers kit) (it asks for disk 2)
22) Click on OK
23) Yes (edit autoexec.bat)
24) Click on OK
25) Click on OK (reboot)
26) Edit the autoexec.bat file to include c:\sql10\bin and c:\sql10\dll in the PATH and make sure that the call of c:\sql10\bin\wsybsetup comes before invocation of windows, but after network startup.
27) REBOOT the machine.
28) Insert Disk 4 - dblib
29) Click on install.exe (in file manager)
30) hit <enter> key
31) enter Y, then <enter> (default is N)
32) hit <enter> key (default is Y)
33) enter 888701, then <enter>
34) enter A then <enter>
35) enter A, then <enter>

36) enter C, then <enter>
37) enter \sql10, then <enter>
38) enter N, then <enter>
39) hit <enter> key
40) hit <enter> key
41) Insert Disk 5 (SYBASE netlib)
42) Click on install.exe (in file manager)
43) hit <enter> key
44) enter Y, then <enter> (default is N)
45) hit <enter> key (default is Y)
46) Novell LAN Workplace TCP/IP, then<enter>
47) c:\windows, then <enter>
48) enter 892829, then <enter>
49) enter C, then <enter>
50) enter \sql10, then <enter>
51) enter fairmont.ivv.nasa.gov, then enter
52) enter 10412, then <enter>
53) enter N, then <enter>
54) enter A, then <enter>
55) enter Y, then <enter>
56) hit <enter>key
57) run c:\subclenv.bat
58) add openclient group (in windows from program manager; File, New)
59) Add wisql item in openclnt group (c:\sql10\bin\wisql.exe)
60) Add wsybping item in openclnt group (c:\sql10\bin\wsybping,.exe)
61) Test by connecting to SYBASE through WISQL. For this you will need to have an account and a sample/test query to run. Contact the folks in Fairmont for this.

* If any of the above steps do not occur as shown then consult the manuals first, Fairmont folks second, and Open Client vendor third..

8.2 Appendix B - SQLNet Installation Instructions

The following SQLNet installation instructions are specific to the ISE infrastructure and will enable access to RTM/Oracle.

1. Insert Oracle Products for Windows Version 7.1 CD into drive
2. run **d:\install\orainst.exe**
3. customer name -> **Intermetrics**
4. accept default directory for installation **c:\orawin**
5. choose Oracle Network Manager 2.1.3.0 a in left window and press install button
6. choose Oracle TCP/IP Adapter 2.0.5.0.4 and press install button
7. close Oracle Install
8. Add a program item to the Oracle program group **c:\orawin\bin\nettest.exe**
9. Double click on the Oracle Network Manager icon in the Oracle program group
10. From the NETMAN object list highlight Community and press the create button
    11. name -> **tnslsnr**
    12. protocol -> **tcp** press OK
13. From the NETMAN object list highlight Node and press the create button
    14. node -> **fairmont**
    15. type -> **unix**
    16. community -> press link button choose **tnslsnr** press OK
17. From the NETMAN object list highlight listener and press the create button
    18. name -> keep default **LISTENER**
    19. node -> keep default **fairmont.world**
    20. under databases press create button
        21. name -> **tnslsnr**
        22. SID -> **rtm**
        23. Oracle Home -> **/usr/local/rtm/oracle7141.sunos5** press OK
    24. under addresses press create button
        25. host -> **fairmont.ivv.nasa.gov**
        26. port -> **1580** press OK button
        27. press OK button
28. From main menu in Oracle Network Manager choose **File Save**
29. when filter dialog box appears click OK
30. **c:\orawin\network**
31. From main menu in Oracle Network Manager choose **File Validate**
32. From main menu in Oracle Network Manager choose **File Generate**
    33. Export Network Definition dialog box choose OK
    34. **c:\orawin\network\admin** press OK button
35. Close Oracle Network Manager
36. Using File manager copy all files in **c:\orawin\network\admin\rtm\fairmont** to **c:\orawin\network\admin**

To test installation using nettest icon in Oracle program group

User ID: **ecs050396**
Password: **ecs050396**
connect string: **tnslsnr**

8.3 Appendix C - SQLWindows Deployment File Installation

The following file list coincides to SQLWindows deployment files installed into the C:/ISE_TOOL directory as a part of the 3 disk deployment file installation.

FILENAME	SIZE	DATE	TIME
SQL.INI	5,582	06-07-96	11:13a
AUTOSQL.DLL	34,555	09-13-95	1:13p
GCMAIL.DLL	47,360	09-13-95	1:13p
GCTRL30.DLL	133,296	09-13-95	1:13p
GEE30.DLL	148,576	09-13-95	1:13p
GRE30.DLL	417,680	09-13-95	1:13p
GSWAG16.DLL	172,096	09-13-95	1:13p
GSWDLL16.DLL	59,520	09-13-95	1:13p
GTIOBJ30.DLL	51,296	09-13-95	1:13p
GTOOLS30.DLL	132,320	09-13-95	1:13p
HPORT50L.DLL	75,768	09-13-95	1:13p
IMAGEMAN.DLL	28,384	01-25-95	5:01a
IMGMAN2.DLL	218,976	09-13-95	1:13p
MAILDLG.DLL	17,680	09-13-95	1:13p
ODBSAL.DLL	4,608	09-13-95	1:13p
OMS.DLL	24,704	09-13-95	1:13p
QCKMAIL.DLL	21,440	09-13-95	1:13p
QCKNLHI.DLL	37,568	09-13-95	1:13p
QCKNLHV.DLL	96,864	09-13-95	1:13p
QCKNLITF.DLL	163,520	09-13-95	1:13p
QCKNLLO.DLL	152,288	09-13-95	1:13p
QCKNLRTF.DLL	120,000	09-13-95	1:13p
QCKNLVIS.DLL	83,728	09-13-95	1:13p
QCKTABCH.DLL	82,640	09-13-95	1:13p
QCKTABS.DLL	147,600	09-13-95	1:13p
QCKTBL.DLL	125,584	09-13-95	1:13p
QCKUTIL.DLL	61,904	01-25-95	5:01a
QGRAPH.DLL	220,640	09-13-95	1:13p
RDW30.DLL	297,488	09-13-95	1:13p
RGRAPH30.DLL	295,600	09-13-95	1:13p
SQLAPIW.DLL	241,152	09-13-95	1:13p
SQLNUM30.DLL	24,034	09-13-95	1:13p
SQLODBW.DLL	224,784	09-13-95	1:13p
SQLORAW.DLL	183,129	09-13-95	1:13p
SQLSQSW.DLL	182,432	09-13-95	1:13p
SQLSST30.DLL	17,536	09-13-95	1:13p
SRVCAP30.DLL	181,536	09-13-95	1:13p

SWIN41.DLL	36,864	09-13-95	1:13p
SWIN50.DLL	38,912	09-13-95	1:13p
SWLIST.DLL	1,888	01-25-95	5:01a
SWOLE20.DLL	354,848	09-13-95	1:13p
VT50.DLL	184,240	09-13-95	1:13p

Exhibit 8.3-1 SQLWindows Deployment Files